

EXHIBIT D

ARIZONA BUILDINGS INSPECTION REPORT

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Prepared for:

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ARIZONA BUILDINGS VISITS REPORT

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INTRODUCTION

Mr. Martin Dies retained Compass Environmental, Inc. to inspect and assess certain asbestos-containing materials (ACM) in Arizona. The ACM included acoustical plaster, and fireproofing at issue in litigation between the building owners and a former asbestos product manufacturer, W.R. Grace & Co. The building visits were conducted by William M. Ewing, CIH and Tod A. Dawson on August 15-18, 2005. Table 1 lists the buildings inspected and the materials at issue.

Table 1. Arizona Buildings

Building Name and Description	ACM at Issue
City of Phoenix Civic Plaza	Fireproofing
City of Phoenix Symphony Hall	Fireproofing and acoustical plaster
Arizona State Dept. of Corrections 1601 West Jefferson St., Phoenix	Fireproofing
State of Arizona Veterans Memorial Coliseum	Fireproofing and acoustical plaster
Maricopa County, East Courts Building	Fireproofing and acoustical plaster
Maricopa County, West Courts Building	Fireproofing
Arizona State Hospital – General Services Bldg.	Acoustical Plaster
Tucson Civic Center Complex – Convention Building	Fireproofing
Tucson Civic Center Complex – Leo Rich Theater	Fireproofing
Tucson Civic Center Complex – Music Hall	Fireproofing
Tucson City Hall	Fireproofing

METHODS AND PROCEDURES

The building inspection process began with reviewing the asbestos material locations and building floor plans. The purpose of this review was to learn the ACM material location, ownership, age, size, use and occupancy.

The physical building inspection was conducted by trained building inspectors accredited pursuant to the requirements of the U.S. Environmental Protection Agency (EPA) Asbestos Hazard Emergency Response Act (AHERA) regulations.¹ A representative of the facility accompanied the inspectors to provide access to the buildings.

For buildings smaller than 75,000 ft² or five stories, all areas containing the previously identified ACM at issue were generally inspected. For larger buildings, or groups of

¹ Code of Federal Regulations, Title 40, Part 763, Subpart E, Appendix C.

identical buildings, repeating functional areas were determined. Examples of functional areas include offices, meeting rooms, and corridors. At least ten percent of the repeating functional areas, or a minimum of five units were randomly selected for inspection.² Where possible, an unoccupied space was substituted to minimize disruption to the building occupants.

The physical building inspection was augmented with surface dust and in some instances debris samples. Surface dust samples were collected and analyzed following ASTM method D5755, "Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Structure Number Concentrations."³ A known surface area, usually 100 cm², was vacuumed to collect dust into a standard filter membrane cassette. All samples were collected using 25mm dust sampling cassettes (Zefon International, Inc., 5350 1st Lane, Ocala, FL 34474, catalogue # Z045CC) with a sampling pump calibrated at 2.0 liters per minute (Mine Safety Appliance Co., Pittsburgh, PA Ultralite™ model).

Each sampling location was photographed and sampling information recorded on a sample log form. This information documented sample location, surface description, sample number, and area sampled. A chain-of-custody form was completed for each batch of samples. Samples were analyzed by MVA, Inc. of Norcross, GA under the direction of James R. Millette, Ph.D.

The sampling plan was developed jointly by William M. Ewing, CIH and James R. Millette, Ph.D., and prescribed the following guidelines.

1. In buildings with spray-applied structural fireproofing, collect at least three dust samples. Three samples will be collected above ceilings where fireproofing exists and three samples below fireproofing if no ceiling exists. The number of samples should be increased to at least one per floor for multi-story buildings. Debris samples may be collected in addition to, or in lieu of dust samples.
2. In buildings with acoustical plaster, collect at least three samples from surfaces below the plaster, high above the floor, having a visual accumulation of dust. The number of samples should be increased to at least one per floor for multi-story buildings. Debris samples may be collected in addition to, or in lieu of dust samples.

When samples of debris were collected they were placed in a sealed container and assigned a sample number. Debris is defined as pieces larger than 1mm in diameter and having the same color and texture as the asbestos-containing source material.

For each asbestos-containing material at issue the inspector determined if it was friable. A material is considered friable if it can be crumbled, pulverized, or reduced to powder

² This procedure was drawn from the procedure developed by the City of New York Department of environmental Protection. See "Final Report, Assessment of the Public's Risk of Exposure to In-Place Asbestos," December 1, 1988, p. 2 - 27.

³ ASTM, "Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Structure Number Concentrations," Method D 5755-03, ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428, June 2003.

by hand pressure, when dry. Materials found to be friable were assessed following the procedure described by the U.S. EPA.⁴ In this procedure a trained inspector considers the location and amount of material, type of damage (e.g., flaking, blistering, water damage, or other signs of physical damage), severity of damage, extent or spread of damage, accessibility of the material, potential for disturbance, causes of damage (e.g., air erosion, vandalism, vibration, water), and preventive measures which might eliminate the reasonable likelihood of undamaged ACM from becoming significantly damaged.

The inspector places each friable material into an assessment category based on its current assessed damage, or its potential for future damage. The possible assessment categories include the following.

1. Significantly damaged friable surfacing ACM
2. Damaged friable surfacing ACM
3. Damaged or significantly damaged friable TSI
4. Damaged or significantly damaged friable miscellaneous ACM
5. Asbestos-containing building material (ACBM) with potential for significant damage
6. ACBM with potential for damage
7. Other friable ACBM

Damaged or significantly damaged friable ACM in buildings have released asbestos in the past and will release asbestos in the future unless interventions are taken. Under the EPA AHERA regulations these interventions include repair, encapsulation, enclosure, and removal; collectively termed abatement or response actions. In concert with these engineering interventions, administrative controls must be implemented to further reduce the exposure hazard. These controls usually include notification, training, special work practices, cleaning procedures, respiratory protection, protective clothing, and other elements that make up what is termed an Operations and Maintenance Program. All of these actions are triggered by the visual assessment of the material by a trained accredited inspector. The role of dust sampling and air sampling are entirely secondary in this process, and as described more fully in my report of December 7, 2005 may be used as additional assessment tools.⁵

SUMMARY OF FINDINGS

City of Phoenix Civic Plaza

The City of Phoenix Civic Plaza was inspected on August 15, 2005 from 1:30 – 4:00 PM. Spray-applied fireproofing reported to be W.R. Grace & Co. MK-3 is located on columns

⁴ Code of Federal Regulations, Title 40, Part 763, Subpart E, 763.88 (Assessment).

⁵ Ewing, W.M., "Application and Use of Dust Sampling for Asbestos," Report dated December 7, 2005.

in the North Plaza Exhibit Halls A and B, and the adjoining meeting rooms. The columns are all enclosed, with 10 of the 26 columns observed with access hatches. The enclosures are hard plaster on metal lathe. The fireproofing may be located on the steel beams which are enclosed and not available to view. All columns serve as conduits for utilities. The utilities observed were water hoses and air hoses (for use by exhibitors during exhibitions), electrical conduit, telephone wire, coaxial cable, drain pipe, water pipe, and gas lines. The 10 columns with access hatches were inspected.

In addition to the fireproofing on the columns, there is fireproofing overspray on many of the utilities. Fireproofing debris was noted in each column inspected. Dust was also present in each column. The fireproofing was friable. The fireproofing was assessed as damaged friable surfacing ACM. Photographs of the fireproofing are found at Appendix A. Three samples of surface dust and three samples of debris were collected from inside these column enclosures. The results are summarized in Tables 2 and 3. The laboratory results are found at Appendices B and C.

TABLE 2. Phoenix Civic Plaza – Exhibit Hall B Dust Sample Results

Sample Number	Sample Location/Description	Photograph Number	Results (s/cc ²)
DUST-01	Exhibit hall B, Column enclosure B4, metal door ledge, metal 100 cm ²	8/15/05 3	4,600,000
DUST-02	Exhibit hall B, Column enclosure B5, metal door ledge, metal 100 cm ²	8/15/05 2	78,000
DUST-03	Exhibit hall B, Column enclosure A3, metal door ledge, metal 100 cm ²	8/15/05 1	570,000
DUST-04	Blank	NA	None Detected

TABLE 3. Phoenix Civic Plaza – Exhibit Hall B Debris Sample Results

Sample Number	Sample Location/Description	Photograph Number	Asbestos Results
DEBRIS-01	Exhibit hall A, column A3, inside column enclosure at base of enclosure, fireproofing debris, tan with visible vermiculite	8/15/05 9	15% chrysotile asbestos
DEBRIS-02	Exhibit hall A, column A2, inside column enclosure at base of enclosure, fireproofing debris, tan with visible vermiculite	8/15/05 8	15% chrysotile asbestos
DEBRIS-03	Exhibit hall A, column B6, inside column enclosure at base of enclosure, fireproofing debris, tan with visible vermiculite	8/15/05 7	15% chrysotile asbestos

There is a risk of exposure to service personnel entering the columns to access the utilities and the asbestos abatement personnel that will remove the fireproofing, overspray, dust and debris. The fireproofing, overspray, debris and dust must be removed at the time of abatement in compliance with the federal EPA asbestos NESHAP

regulations and the corresponding State of Arizona requirements. Until that time the column enclosures are to remain locked with access granted only to trained personnel.

City of Phoenix – Symphony Hall

Symphony Hall was reported to contain W.R. Grace & Co. MK-3 fireproofing and Zonolite Acoustical Plaster. The building was visited on August 16, 2005 between 6:30 and 8:30 AM. At the time of the visit the building was nearing completion of a major renovation. The acoustical plaster was reported removed prior to renovation in the main lobby. Some of the structural fireproofing (applied to steel structure) had also been removed. What fireproofing remains that is accessible has been encapsulated (See photograph 2/17, Appendix A). The encapsulated fireproofing appeared to be well coated except for isolated locations where the fireproofing was cut into to attach hangers for conduits and other utilities. Encapsulation is a temporary solution to reduce fiber release from the fireproofing. At some point, prior to renovation and/or demolition activities, the remaining asbestos-containing fireproofing will need to be properly removed in accordance with federal and state regulations. No surface samples were collected as this was a construction site and very little ACM remained accessible.

Arizona State Department of Corrections (1601 Jefferson St., Phoenix)

This building was inspected between 9:30-11:45 AM on August 16, 2005. There is spray-applied fireproofing reported to be W.R. Grace & Co. MK-3 applied to a poured-in-place waffle concrete deck. No fireproofing was observed on the basement level. The fireproofing was present on floors 1-4. The fireproofing is concealed behind suspended acoustical ceiling tiles. Upon arrival inmates were observed installing wire above the suspended ceiling on the first floor elevator lobby without following good practices. This was brought to the attention of our building contact and the wire installation stopped. The installation of wires above a suspended ceiling, below MK-3 fireproofing has been shown to result in significant asbestos exposures.⁶ Photo 3/21 (Appendix A) taken in room 1305 is an example of wire installation above the suspended ceiling in this building.

Six surface dust samples were collected from light fixtures in the suspended ceiling system and analyzed for asbestos. The results are summarized in Table 4.

Table 4. Arizona State Department of Corrections Building Dust Sample Results

Sample Number	Sample Location/Description	Photograph Number	Results (s/cm ²)
DUST-05	Fourth floor, room 4309, top of 2'x 2' light fixture, metal 100 cm ²	8/16/05 11	13,000
DUST-06	Third floor, room 3406, top of 2'x 2' light fixture, metal 100 cm ²	8/16/05 8	850,000
DUST-07	Third floor, room 3111, top of 2'x 2' light fixture, metal 100 cm ²	8/16/05 5	94,000
DUST-08	Second floor, room 2401, top of 2'x 2' light	8/16/05	110,000

⁶ Keyes, D.L., et al., "Exposure to Airborne Asbestos Associated with Simulated Cable Installation Above A Suspended Ceiling," *Amer. Ind. Hyg. Assoc. J.* 52(11):479-484 (1991).

	fixture, metal 100 cm ²	1	
DUST-09	Second floor, room 2304, top of 2'x 2' light fixture, metal 100 cm ²	8/16/05 24	130,000
DUST-10	First floor, room 1305, top of "new" 2'x 2' light fixture, metal 100 cm ²	8/16/05 22	7,800

Five of the dust samples [DUST 05 – DUST 09] were collected from older light fixtures. One sample [DUST 10] was collected from a "new" light fixture. The mean (average) concentration on the old light fixtures was 240,000 asbestos structures per square centimeter (s/cm²). The concentration measured on the "new" light fixture was 7800 s/cm². The concentration of asbestos on the surfaces of the suspended ceiling throughout floors 1-4, except the section of the first floor with the new fiberglass ceiling tile and new light fixtures, represent a source of exposure for persons that may disturb the dust. On the new ceiling and new light fixtures the asbestos concentration at that time (August 2005), and based on the one sample, appears low enough to allow maintenance work without the risk of significant exposure. However, as time passes and more asbestos dust accumulates on this new ceiling system, it will become a source for asbestos exposure. The material was assessed as damaged friable surfacing ACM. Photographs of the ACM material are found in Appendix A.

Veterans Memorial Coliseum

The State of Arizona Veterans Memorial Coliseum was inspected during the afternoon of August 16, 2005. The building has acoustical plaster reported to be Zonolite Acoustical Plastic. The acoustical plaster was observed on the upper and lower levels of the perimeter concourse. The acoustical plaster is painted white on the upper level and painted yellow on the lower level. The acoustical plaster on the ceiling above four entrances to the upper concourse was removed in the Summer of 2005. According to the building escort (Gordon) the materials had suffered water damage and begun to delaminate from the substrate. Isolated areas outside of the completed abatement areas were visible. Water damage and physical damage was frequently noted. A set of three dust samples were collected from each concourse level. The results are summarized in Table 5.

Table 5. Veterans Memorial Coliseum Dust Sample Results

Sample Number	Sample Location/Description	Photograph Number	Results (s/cm ²)
DUST-11	Upper concourse, above Portal 10, metal 100 cm ²	Roll 3 18 & 17	78,000
DUST-12	Upper concourse, above Portal 15, metal 100 cm ²	Roll 3 14	170,000
DUST-13	Upper concourse, above Portal 6, metal 100 cm ²	Roll 3 12	<47,000
DUST-14	Lower concourse, southeast, bare metal pipe above club entrance, 100 cm ²	Roll 3 10 & 9	<47,000
DUST-15	Lower concourse, west side, top of metal louvers, metal 100 cm ²	Roll 3 6 & 5	47,000

DUST-16	Lower concourse, northeast side, top of roll-up door to arena floor, metal 100 cm ²	Roll 3 3	<47,000
DUST-17	Blank	NA	None Detected

Asbestos was detected in all samples except the blank, however a high sensitivity was reported due to non-asbestos dust requiring serial dilutions. Two samples [DUST-11 and DUST-12] appear elevated. The painted surface appears to be acting as an encapsulant to reduce the release of asbestos from the acoustical plaster. This material was assessed as friable surfacing ACM with a potential for damage, noting the damaged ACM was largely recently removed. The full extent of previous acoustical plaster abatements has not been determined. There is also fireproofing on some of the beams and columns of this building. Photographs of the ACM material are found in Appendix A.

Maricopa County – East Courts Building

This building was inspected on August 16, 2005 between 7:30 and 10:30 PM. The East Courts building has a lower lobby, floors 1-9, and a penthouse. The fireproofing had been removed from all areas of the building except floors 5-9 and the core area of the first floor. The fireproofing was also observed in the elevator shafts on steel bracing. The spray-applied fireproofing is present on the columns and beams with overspray of the flat concrete deck. The fireproofing was reported to be W.R. Grace & Co. MK-3. The areas with the remaining fireproofing house courtrooms, offices, corridors, and bathrooms.

In many of the office areas (judges' suites) the ceiling tiles have been replaced and the light fixtures and air diffusers cleaned. In the corridors and lobby areas older ceiling tiles are present, and the light fixtures and diffusers did not appear to have been cleaned. The cleaned fixtures appeared to have a lighter deposit of surface dust than the fixtures not cleaned. Three surface dust samples were collected from the cleaned fixtures (DUST-20, DUST-21 and DUST-23) and three from the not cleaned fixtures (DUST-22, DUST-24 and DUST-25). The results are reported in Table 6.

Table 6. Maricopa County – East Courts Building Dust Sample Results

Sample Number	Sample Location/Description	Photograph Number	Results (s/cm ²)
DUST-20	Suite 914, Judges chambers, top of supply air diffuser, metal 100 cm ²	22	550,000
DUST-21	Suite 812, Judges chambers, top of supply air diffuser, metal 100 cm ²	17	1,900
DUST-22	Seventh floor, elevator lobby, top of light fixture above egg crate ceiling panels	15	2,700,000
DUST-23	Suite 611, top of supply air diffuser, metal 100 cm ²	12	55,000
DUST-24	Sixth floor, elevator lobby, top of light fixture, metal 100 cm ²	10	580,000
DUST-25	Fifth floor, elevator lobby, outside ladies room, metal 100 cm ²		2,000,000

The average of the three samples from the cleaned fixtures was 200,000 s/cm². The average of the three samples taken from the not cleaned fixtures was 1,800,000 s/cm². The fireproofing is assessed as damaged friable surfacing ACM.

Twenty courtrooms on floors 5-9 reportedly contain an acoustical plaster product manufactured by W.R. Grace & Co. This material was assessed as friable ACBM with the potential for damage. Photographs of the ACM material are found in Appendix A.

Maricopa County – West Courts Building

This building was inspected on August 16, 2005 between 7:30 and 10:30 PM. The West Courts Building contains a lower lobby, floors 1-6 and a penthouse level. Fireproofing has been removed from all areas of the building except floors 2-4, a small area of floor 1, the elevator shafts, and the return air shaft. The fireproofing is spray-applied to beams and columns with overspray onto a flat concrete deck. This building is used as an office building. Courtrooms are not located in this building.

Five surface dust samples were collected from the ceiling plenum space. These results are summarized in Table 7. The dust samples in the West Courts building were collected from plenum surfaces at random without knowledge if the fixture had been cleaned or not cleaned as was the case in the East Courts building. Three of the samples [DUST-26, DUST-28 and DUST-29] indicate no significant asbestos dust. The results for sample DUST-30 would be considered a moderate asbestos dust loading, and sample DUST-27 a high dust loading. Additional sampling would be necessary to further characterize the asbestos dust loadings in the plenum space of the West Courts building. The fireproofing was assessed as friable surfacing ACM. Some of the fireproofing was assessed as damaged friable surfacing ACM and some of the fireproofing was assessed as surfacing ACM with the potential for damage. Photographs of the ACM material are found in Appendix A.

Table 7. Maricopa County – West Courts Building Dust Sample Results

Sample Number	Sample Location/Description	Photograph Number	Results (s/cm ²)
DUST-26	Fourth floor, elevator lobby, top of light fixture, metal 100 cm ²	Roll 4 8	<4,700
DUST-27	Fourth floor, suite 400, center of open work area, top of light fixture, metal 100 cm ²	Roll 4 4 & 3	2,670,000
DUST-28	Third floor, break room, top of light fixture, metal 100 cm ²	Roll 4 1	6,300
DUST-29	Third floor, open work area, top of light fixture, opposite side of floor from break room, metal 100 cm ²	Roll 5 24	<4,700
DUST-30	Second floor, pretrial services reception, top of light fixture, metal 100 cm ²	Roll 5 22	27,000
DUST-31	Blank	NA	None Detected
DUST-32	Blank	NA	None Detected

Arizona State Hospital – General Services Building

The General Services Building at the Arizona State Hospital at 2500 East Van Buren in Phoenix was inspected on August 18, 2005 between 2:00 and 3:50 PM. There is acoustical plaster spray-applied to the concrete waffle pattern deck of this one story building. Approximately half of the deck is coated completely with the acoustical spray. A portion of the ceiling is hidden behind a suspended acoustical ceiling. The acoustical plaster was reported to be Zonolite Acoustical Plastic and Zonocoustic.

Where the acoustical plaster is not hidden by the suspended ceiling, debris from the ceiling spray was visible on the tops of ledges, file cabinets, furniture, prescription drug bins, the carpeting, and other surfaces. Three samples of the debris was collected and analyzed for asbestos. These results are summarized in Table 8. These results consistently found 10% chrysotile asbestos in a matrix containing vermiculite and gypsum. Three surface dust samples were also collected and analyzed for asbestos. The results are summarized in Table 9. The acoustical plaster was assessed as damaged or significantly damaged friable surfacing ACM. Photographs of the ACM material are found in Appendix A.

Table 8. Arizona State Hospital – General Services Building Debris Samples

Sample Number	Sample Description	Photograph	Results
DEBRIS-101	Southwest room (Pharmacy), door number 26, acoustical plaster debris on top of two metal file cabinets in office area, tan particles, <1 cm in diameter (2mm typically) visible vermiculite in debris	Roll 6 7	10% Asbestos
DEBRIS-102	Southwest room (Pharmacy), door number 26, acoustical plaster debris on blue low nap carpet	Roll 6 6	10% Asbestos
DEBRIS-103	Southwest room (Pharmacy), door number 26, acoustical plaster debris in three pharmaceutical (drug) storage bins	Roll 6 5	10% Asbestos

Table 9. Arizona State Hospital – General Services Building Dust Samples

Sample Number	Sample Location/Description	Photograph Number	Results (s/cm ²)
DUST-51	Northeast room, top of pendant light fixture, east end of room, metal 100 cm ²	Roll 6 2	47,000
DUST-52	Northeast room, top of pendant light fixture, center of room, metal 100 cm ²	Roll 6 1	94,000
DUST-53	Northeast room, top of pendant light fixture, west end of room, metal 100 cm ²	Roll 7 24	140,000

Tucson Civic Center Complex – Convention Building

The Tucson Civic Center complex consists of a series of connected buildings and two separate theaters. The Convention building houses meeting rooms, offices, corridors, a large lobby, and rest rooms. This building was inspected on August 17, 2005. The spray-applied fireproofing in this building was reported to be W.R. Grace & Co.'s MK-3. The material was observed sprayed onto columns, beams and overspray onto the corrugated metal deck. The fireproofing is concealed behind suspended ceiling tiles located approximately 16 feet above the floor. It was reported removed from the mechanical rooms. There was visible dust and debris located on surfaces below the fireproofing. Five dust samples were collected. These results are summarized in Table 10. Delamination was noted at one location above the Graham Room. The material was assessed as damaged friable surfacing ACM. Photographs of the ACM material are found in Appendix A.

Table 10. Tucson Civic Center Complex – Convention Building Dust Samples

Sample Number	Sample Location/Description	Photograph Number	Results (s/cm ²)
DUST-40	Forty feet from west end of the meeting room hallway, top of metal air duct, metal 100 cm ²	21	1,900,000
DUST-41	Mohave Room, west side at center, tall ceiling, from top of light fixture, metal 100 cm ²	17	110,000
DUST-42	Graham Room, tall ceiling, four feet from south wall, six feet from east wall, from top of light fixture, metal 100 cm ²	14	79,000
DUST-43	Meeting room lobby, northeast quadrant, top of light fixture, metal 100 cm ²	11	240,000
DUST-44	Room 362-1, south of hallway, top of light fixture, metal 100 cm ²		<47,000

Tucson Civic Center Complex – Leo Rich Theater

The Leo Rich Theater was inspected on August 17, 2005. Spray-applied fireproofing is located on beams with overspray on the corrugated metal deck. The fireproofing is concealed behind a suspended 12"x 12" splined tile ceiling. The fireproofing was reported to be W.R. Grace & Co.'s MK-3. Fireproofing debris was noted on the tops of air supply ducts. Dust samples were not collected at this location since safe access to sampling surfaces could not be arranged. The material was assessed as damaged friable surfacing ACM. Photographs of the ACM material are found in Appendix A.

Tucson Civic Center Complex – Music Hall

The Music Hall was inspected on August 17, 2005. Spray-applied fireproofing was observed throughout the attic area and above the stage. The material is sprayed onto beams and columns with overspray onto catwalks, hand railings, and steps. The material was reported to be W.R. Grace & Co.'s MK-3. Fireproofing debris was noted on

horizontal surfaces in the attic. Five dust samples were collected from the metal air ducts in the attic. The results are summarized in Table 11. The material was assessed in the attic as damaged friable surfacing ACM. Photographs of the ACM material are found in Appendix A.

The attic space of the Music Hall was the subject of a series of tests conducted by Materials Analytical Services, Inc. (MAS) on October 9, 2006.⁷ These tests demonstrated the airborne concentrations of asbestos that result from cleaning practices disturbing settled dust in the attic space. These tests demonstrate why the City of Tucson requires all persons entering this space to wear a respirator. However, experts retained by W.R. Grace & Co., Inc. propose the asbestos in the settled dust of the Tucson Music Hall attic did not come from their client's product but from other asbestos products in the building, or floated in from outdoors.^{8,9} Neither of these experts inspected the Music Hall, or more importantly, the attic space. The only material suspected of containing asbestos in the attic space is the Mono-kote fireproofing. The attic space is not ventilated, has no windows, and only one hatch-type door for entry and exit. The fireproofing, associated debris and dust have the identical color. Particles of mica (component if vermiculite) is visually present on surfaces of the attic space. The only known source of vermiculite in the attic is the fireproofing. The report (at page 25) by Morse proposes ambient asbestos fibers floating around downtown Tucson, AZ enter the attic and settle onto horizontal surfaces. To make the calculation work there are several assumptions. The first assumption is the ambient air of Tucson, AZ contains 0.0062 asbestos structures per cubic centimeter (s/cc) (non-urban) or 0.0116 s/cc (urban), citing a 1985 E. Chatfield report from Canada (reference not provided). This is a poor assumption. The U.S. Environmental Protection Agency found the median outdoor airborne asbestos level in the United States to be <0.00001 s/cc (mean of 0.00039 s/cc).¹⁰ The theoretical deposition of ambient asbestos also assumes an air exchange rate of 3 per hour. This assumes that an amount of outside air equal to the entire volume of air in the attic enters every 20 minutes from outside. To keep the attic from blowing up like a balloon, the same amount must exit the attic every 20 minutes. No evidence was provided to support this speculation.

The source of the significantly elevated asbestos in the settled dust (and the debris) in the Tucson Music Hall attic is the Mono-kote fireproofing. This finding was confirmed by subsequent laboratory analyses of the attic settled dust by MVA finding primarily vermiculite, gypsum and chrysotile asbestos. A copy of this report is attached as Appendix D.

⁷ Longo, W.E., "Expert Report of William E. Longo, Ph.D., Prepared on Behalf of the Property Damage Asbestos Claimants Represented by the Law Firm of Dies & Hile, LLP," October 25, 2006.

⁸ Morse, R.G., "Rebuttal Report of Roger G. Morse AIA On Expert Report of William E. Longo, Ph.D., Prepared on Behalf of the Property Damage Asbestos Claimants Represented by the Law Firm of Dies & Hile, LLC, dated October 25, 2006," November 14, 2006.

⁹ R.J. LeeGroup, Inc., "Rebuttal Expert Report, Evaluation of Longo Dust Studies," November 14, 2006.

¹⁰ Chesson, J., et al., "Airborne Asbestos in Public Buildings," *Environmental Research*, Vol. 51, pp. 100-107 (1990).

Table 11. Tucson Civic Center Complex – Music Hall Dust Samples

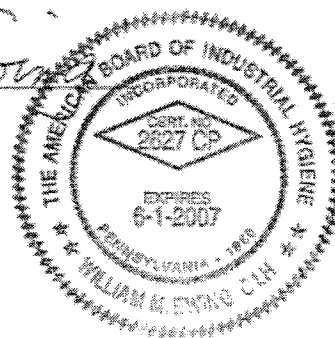
Sample Number	Sample Location/Description	Photograph Number	Results (s/cm ²)
DUST-45	Attic, northeast area, top of metal air duct, metal 100 cm ²	24	2,400,000
DUST-46	Attic, southeast area, top of metal air duct, metal 100 cm ²	23	2,000,000
DUST-47	Attic, north central, top of metal air duct, metal 100 cm ²	19	17,000,000
DUST-48	Attic, northwest area, top of metal air duct, metal 100 cm ²	17	3,100,000
DUST-49	Attic, southwest area, top of metal air duct, metal 100 cm ²	15	710,000
DUST-50	Blank	NA	None Detected

Tucson City Hall

The Tucson City Hall building was visited on August 17, 2005. The spray-applied fireproofing is located above the suspended ceiling of the building and also found in the return air shaft. The fireproofing was reported to be W.R. Grace & Co.'s MK-3. The fireproofing was observed at selected locations. Based on these observations the fireproofing was assessed as damaged friable surfacing ACM. No dust or debris sampling was performed during this visit since additional advanced notification is necessary to have the ventilation system shut down in accordance with the City of Tucson Asbestos Operations and Maintenance Program. Photographs taken during this visit are found in Appendix A.

This report prepared by:

William M. Ewing, CIH



APPENDIX A

PHOTOGRAPHS AND PHOTOGRAPH LOGS FOR BUILDING INSPECTIONS

**STATE OF ARIZONA
PHOTOGRAPH LOG
AUGUST 2005**

Civic Plaza; Phoenix, Arizona

Roll Number/Photo Number	Sample Number	Photograph Description
1/13	NA	Exhibit Hall A, column A3, view inside enclosure of column and fireproofing overspray
1/12	NA	Exhibit Hall A, column A3, view up column, inside enclosure
1/11	NA	Exhibit Hall A, column A2, view of enclosed columns
1/10	NA	Exhibit Hall A, column A3, view of water hose with fireproofing debris
1/9	Debris-01	View of fireproofing debris, tan with visible vermiculite from column enclosure A3
1/8	Debris-02	View of fireproofing debris at base of column A2 enclosure
1/7	Debris-03	View of debris inside column enclosure B6
1/6	NA	View of fireproofing in column B6 enclosure
1/5	NA	View of "new" junction box in column B6 enclosure
1/4	NA	View of delaminated fireproofing overspray at base of column enclosure B4
1/3	Dust-01	Exhibit Hall B, Column B4, metal ledge at base of hatch
1/2	Dust-02	Exhibit Hall B, column B5, metal ledge at base of hatch
1/1	Dust -01	Exhibit Hall A, column A3, metal ledge at base of hatch

Symphony Hall; Phoenix, Arizona

Roll Number/Photo Number	Sample Number	Photograph Description
2/24	NA	Exterior view of Symphony Hall
2/23	NA	Exterior view of Symphony Hall
2/22	NA	View of replacement acoustical plaster in lobby
2/21	NA	View of replacement acoustical plaster in lobby
2/20	NA	View of encapsulated fireproofing in storeroom
2/19	NA	View of encapsulated fireproofing in storeroom
2/18	NA	View of replacement fireproofing in southeast corner entry, above ceiling
2/17	NA	West side of main hall, view of encapsulated fireproofing
2/16	NA	West side of main hall, view above ceiling under balcony
2/15	NA	West side of main hall, view above ceiling under balcony
2/14	NA	Main hall view toward balcony and projection booths

Arizona State Department of Corrections; Phoenix, Arizona

Roll Number/Photo Number	Sample Number	Photograph Description
2/13	NA	Forth floor, room 4309, view of waffle deck above ceiling
2/12	NA	Forth floor, room 43009, view of fireproofing on interior of waffle deck
2/11	Dust-05	Forth floor, room 4309, view of dust location on top of 2'x2' light fixture/supply air vent
2/10	NA	Third floor, room 3406, view of area above ceiling
2/9	NA	Third floor, room 3406, view of area above ceiling
2/8	Dust-06	Third floor, room 3406, view of dust sample location from light fixture/supply air vent
2/7	NA	Third floor, room 3111, view above ceiling tile
2/6	NA	Third floor, room 3111, view of disconnected return air duct above ceiling tile
2/5	Dust-07	Third floor, room 3111, view of dust sample location
2/4	NA	Second floor, room 2401, view west of plenum space above ceiling tile
2/3	NA	Second floor, room 2401, view east of plenum space
2/2	NA	Second floor, room 2401, view below ceiling tile with sprinkler head
2/1	Dust-08	Second floor, room 2401, view of dust sample location
3/24	Dust-09	Second floor, room 2304, view of dust sample location
3/23	NA	Second floor, room 2304, view of space above suspended ceiling
3/22	Dust-10	First floor, room 1305, view of dust sample location
3/21	NA	First floor, room 1305, view above suspended ceiling
3/20	NA	Exterior view of south side of Department of Corrections building

Veterans Memorial Coliseum; Phoenix, Arizona

Roll Number/Photo Number	Sample Number	Photograph Description
3/19	NA	Upper concourse, at exterior entrance across from Portal 11, removed acoustical plaster with original at right
3/18	Dust-11	Upper concourse, dust sample location from top of metal sprinkler plate at portal 10
3/17	Dust-11	View of dust sample location at Portal 10
3/16	NA	View of acoustical plaster, upper concourse, Portal 15
3/15	NA	View of acoustical plaster between Portal 16 and 17, gray color area is replacement repair material
3/14	Dust-12	View of dust sample location, top of metal plate above sprinkler head
3/13	NA	Upper concourse, south side, view of acoustical plaster on ceiling above concessions
3/12	Dust-13	View of surface dust sample location at metal plate above Portal 6

Roll Number/Photo Number	Sample Number	Photograph Description
3/11	NA	View of unpainted (?) acoustical plaster above 2'x4' suspended ceiling panels at lower level concourse
3/10	Dust-14	View of dust location, lower concourse, on bare metal pipe above club entrance
3/9	Dust-14	View of dust sample location, lower concourse, entrance to club
3/8	NA	Lower concourse, west side, view of delaminating acoustical plaster
3/7	NA	Lower concourse, west side, water damaged acoustical plaster, approximately 9 square feet
3/6	Dust-15	Lower concourse, west side large open storage room, view of dust sample location from top of metal louvers
3/5	Dust-15	Lower concourse, west side large open storage room, view of dust sample location from top of metal louvers
3/4	NA	Lower concourse, northeast side, view of delaminated acoustical plaster, approximately 4 square feet
3/3	Dust-16	Lower concourse, northeast side, view of dust sample location from top of roll-up door to area floor
3/2	NA	Exterior view of Coliseum
3/1	NA	Exterior view of Coliseum

Maricopa County, East Court Building; Phoenix, Arizona

Roll Number/Photo Number	Sample Number	Photograph Description
4/24	NA	Courtroom 914, view of acoustical plaster above judge's bench and open "egg crate" ceiling with fireproofing above
4/23	NA	Courtroom 914, view of acoustical plaster above gallery area at rear of courtroom
4/22	Dust-20	Suite 914, sample location from top of supply air diffuser (mounted atop suspended light fixture in ceiling plenum)
4/21	NA	Suite 914, view of fireproofing on beams with overspray on flat concrete deck
4/20	NA	Suite 914, view of fireproofing on column at intersection with beams
4/19	NA	Suite 914, view of water damage to fireproofing above ceiling
4/18	NA	View above suspended ceiling in corridor outside suite 914
4/17	Dust-21	Suite 812, view of dust sample location, top of supply air diffuser
4/16	NA	Suite 812, view of fireproofing and overspray above suspended ceiling in part of suite
4/15	Dust-22	Seventh floor, elevator lobby outside men's room, view of dust sample location from top of suspended light fixture
4/14	NA	Seventh floor, elevator lobby, view of egg crate ceiling panels with lights above

Roll Number/Photo Number	Sample Number	Photograph Description
4/13	NA	Courtroom 611, delaminating acoustical plaster above gallery at rear of courtroom
4/12	Dust-23	Sixth floor, suite 611, view of dust sample location from top of supply air diffuser
4/11	NA	Sixth floor, suite 611, view of light fixture showing cleaned surface
4/10	Dust-24	Sixth floor, elevator lobby at center, view of light fixture from which the dust sample was collected (configuration of area prevented picture of surface sampled)
4/9	Dust-25	Fifth floor, elevator lobby, view of dust sample location on top of suspended light fixture (two areas equaling 100 cm ²)

Maricopa County, West Court Building; Phoenix, Arizona

Roll Number/Photo Number	Sample Number	Photograph Description
4/8	Dust-26	Forth floor, elevator lobby, view of dust sample location from light fixture
4/7	NA	Forth floor, lobby, view above suspended ceiling
4/6	NA	Forth floor, lobby, view above suspended ceiling
4/5	NA	Forth floor, lobby, view of fireproofing and overspray on supply air duct insulation
4/4	Dust-27	Suite 400, center work room, view of dust sample location
4/3	Dust-27	Suite 400, center work room, view of dust sample location
4/2	NA	Suite 400, view below ceiling tiles
4/1	Dust-28	Third floor, view of dust sample location from top of light fixture
5/24	Dust-29	Third floor, open work area, view of surface dust sample location from top of light fixture
5/23	NA	Second floor, elevator lobby, cut ceiling tiles probably for cable penetrations
5/22	Dust-30	Second floor, Pretrial Services reception area, view of dust sample location from top of suspended light fixture

Tucson Civic/Convention Center, Convention Building; Tucson, Arizona

Roll Number/Photo Number	Sample Number	Photograph Description
5/21	Dust-40	Hallway outside Maricopa room, approximately 40 feet from west end, view of dust sample location from top of duct
5/20	NA	Hallway outside Maricopa room, view of fireproofing on beam
5/19	NA	View of fireproofing and overspray above hallway
5/18	NA	View of fireproofing, above hallway 30 feet from west end
5/17	Dust-41	Mohave room, approximately six feet from west side and 19 feet from south wall, view of dust sample location from top of light fixture

Roll Number/Photo Number	Sample Number	Photograph Description
5/16	NA	Mohave room, view of fireproofing debris on light fixture
5/15	NA	Mohave room, view of fireproofing on beam, overspray on duct and metal corrugated deck
5/14	Dust-42	Graham room, view of dust sample location from top of metal light fixture
5/13	NA	Graham room, view of fireproofing debris from delamination above covering approximately 6 ceiling tiles
5/12	NA	Graham room, view of fireproofing delamination location from corrugated metal deck
5/11	Dust-43	Meeting room lobby, northeast quadrant, view of dust sample location from top of light fixture
5/10	NA	Meeting room lobby, northeast quadrant, view above suspended ceiling system
5/9	Dust-44	Room 362-1, view of dust sample location from top of suspended light fixture

Tucson Civic/Convention Center, Leo Rich Theatre: Tucson, Arizona

Roll Number/Photo Number	Sample Number	Photograph Description
5/8	NA	Plenum space above lobby, view of fireproofing on beam with overspray on corrugated metal deck
5/7	NA	Plenum space above lobby, view of dust and fireproofing debris on air duct
5/6	NA	Plenum space above lobby, view of fireproofing
5/5	NA	Plenum space above lobby, view of fireproofing
5/4	NA	Lobby, view of lobby with fireproofing above suspended ceiling tile system

Tucson Civic/Convention Center, Music Hall: Tucson, Arizona

Roll Number/Photo Number	Sample Number	Photograph Description
5/3	NA	Attic level, view of fireproofing on beam and fireproofing debris
5/2	NA	Attic level, view of fireproofing with water damage
5/1	NA	Attic level, fireproofing overspray on catwalk, steps, and handrail
6/24	Dust-45	Attic level, view of dust sample location from top of air duct
6/23	Dust-46	Attic level, view of dust sample location from top of air duct
6/22	NA	Attic level, view of fireproofing overspray and debris on steps of catwalk
6/21	NA	Attic level, view of damaged fireproofing above catwalk
6/20	NA	Attic level, view of water damage to fireproofing
6/19	Dust-47	Attic level, view of dust sample location on top of metal duct
6/18	NA	Attic level, view of fireproofing debris on duct below beam applied with fireproofing

Roll Number/Photo Number	Sample Number	Photograph Description
6/17	Dust-48	Attic level, view of metal air duct from which dust sample was taken (see lower left corner of picture)
6/16	NA	Attic level, view of fireproofing hanging loose at surface (physical damage)
6/15	Dust-49	Attic level, view of metal air duct from which dust sample was collect

Tucson City Hall; Tucson, Arizona

Roll Number/Photo Number	Sample Number	Photograph Description
6/14	NA	Exterior view of City Hall building
6/13	NA	Eighth floor, return air shaft with fireproofing overspray on pipes
6/12	NA	Eighth floor, view of supply air ducts in return air shaft
6/11	NA	Eight floor, view of co-axial cables in return air shaft
6/10	NA	Seventh floor, view of typical suspended ceiling system in building

General Services Building; Phoenix, Arizona

Roll Number/Photo Number	Sample Number	Photograph Description
6/9	NA	Southwest room (Pharmacy, door #26), view of acoustical plaster on ceiling above air supply deflector
6/8	NA	Southwest room (Pharmacy, door #26), view of acoustical plaster on waffle ceiling
6/7	Debris-101	Southwest room (Pharmacy, door #26), view of acoustical plaster debris on top of file cabinet
6/6	Debris-102	Southwest room (Pharmacy, door #26), view of acoustical plaster debris on carpet
6/5	Debris-103	Southwest room (Pharmacy, door #26), view of acoustical plaster debris in prescription drug bins (3 bins)
6/4	NA	Southwest room, view of waffle ceiling with exposed acoustical plaster
6/3	NA	Northeast room, view of acoustical plaster on waffle deck above 2'x4' lay-in ceiling panels with cables
6/2	Dust-51	Northeast room, view of dust sample location from top of pendant light fixture
6/1	Dust-52	Northeast room, view of dust sample location from top of pendant light fixture
7/24	Dust-53	Northeast room, view of dust sample location from top of pendant light fixture